

BEES IN THE COLLECTION OF THE U. S. NATIONAL MUSEUM. 1.

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In all large museums, the entomological collections tend to accumulate faster than they can be worked up. New species may be collected, and remain unstudied for many decades, and perhaps eventually be described from specimens captured many years later. Thus, I have recently had occasion to work up some bees from Mexico in the Berlin Museum, collected by Ferdinand Deppe as long ago as 1829. Several were still new, but others had been published in the meanwhile by Cresson and myself. In the case of the United States National Museum, the collections do not date so far back, but there is nevertheless a quantity of valuable material among the bees, which deserves to be described or reported. It will be the purpose of this series of papers to discuss such portions of this material as may be submitted to the present writer from time to time.

In the descriptions of the venation the following abbreviations are used: *s. m.* = submarginal cell; *r. n.* = recurrent nervure; *t. c.* = transverse-cubital nervure; *b. n.* = basal nervure; *t. m.* = transversomedial nervure.

CERATINA (CERATINIDIA) HIEROGLYPHICA, var. JAPONICA, new variety.

Female.—Prothorax, including tubercles, entirely black. The specimen is of the full size of *hieroglyphica*; the light reversed T on the clypeus has the arms longer than the stem, and the latter is partly divided into two parts by a median longitudinal black line; the lateral face-marks are reduced to a longitudinal mark above and a transverse mark below; the mesothorax has two slender discal lines, and a short mark above each tegula; the scutellar patch is deeply notched in front; the other markings call for no remark. Scape entirely black.

Habitat.—Japan (Koebele). *C. hieroglyphica* is quite variable, but the mainland forms, including the Chinese var. *morawitzii* Stadelmann, always have yellow on the prothorax, so far as I know.

Type.—Cat. No. 13420, U.S.N.M.

A word may be added concerning the Philippine species of *Ceratinidia*. As described, they can be separated as follows:

- Larger, length 9 to 11 mm., clypeus marked with yellow, scape with yellow only in male (Philippines, see Ashmead).....*hieroglyphica* Smith.
 Smaller, length 7 mm. or less..... 1.
 1. Clypeus, and scape in front yellow; "female" (?male).....*compacta* Smith.
 Clypeus only marked with yellow..... 2.
 2. Scape of female nearly all yellow; lateral face-marks of female not divided into separate marks (Manila).....*philippinensis* Ashmead.
 Scape of female black; lateral face-marks divided.....*tropica* Crawford.

The exact locality of *compacta* is unknown. I think it probable that it came from one of the southern islands, as the greater development of yellow is characteristic of the more southern species of *Ceratinidia*. There may perhaps be some doubt about the reputed sexes of the types of *compacta* and *philippinensis*. Some years ago I hastily examined the type of *philippinensis* and sketched the face-marks, which are essentially as in *hieroglyphica*. The vertical mark on the clypeus is strongly notched above. The difference in the lateral face-marks of *tropica* and *philippinensis*, as given in the table is probably due to individual variation; at least, *hieroglyphica* varies in this manner. It is probable that *C. hieroglyphica* does not really occur in the Philippines, being represented there by the smaller forms (extremely closely allied to it) called *philippinensis* and *tropica*.

Since writing the above, I have received from Mr. S. A. Rohwer particulars concerning *C. tropica* and *philippinensis*, each of which is represented by both sexes in the National Museum. The two forms are separable as follows:

Female.

- Mesothorax with two pale lines; tibiae yellow, black beneath; abdominal markings heavy, broader; clypeus with a large light reversed T; lateral face-marks not divided; scape partly light.....*philippinensis* Ashmead.
 Mesothorax unmarked; tibiae nearly entirely black; abdominal markings much narrower; clypeus with only a transverse subapical light bar; lateral face marks each divided into two spots; scape dark.....*tropica* Crawford.

Males.

- Pale spot on scutellum quadrate; tibiae yellow except a black spot beneath; clypeus yellow; lateral face-marks broader; scape partly light.....*philippinensis* Ashmead.
 Pale spot on scutellum triangular; tibiae black except a pale line above; clypeus dark, with a very broad light bar, which has a median lobe or process above; lateral face-marks narrower; scape dark.....*tropica* Crawford.

APIS INDICA JAPONICA Radoszkowski.

Worker.—Darker than typical *indica*; bases of abdominal segments 3 to 5 with conspicuous narrow whitish hair-bands.

Form a. Scutellum dark; abdomen without fulvous. Sapporo Agricultural College, Japan, December, 1896 (M. Matsumura). Two examples.

Form b. Scutellum dull yellow; second abdominal segment variably fulvous, always so at base. Japan, two examples (Mitsukuri); Swatow, China (Kœbele).

Male.—Abdomen broad and short, black without bands, but with dense pale hair at base. Japan, No. 127.

This is a feebly distinguished subspecies, perhaps originally confined to Japan, but now occurring also in China. It always has the labrum more or less reddish or yellowish, as usual in the *indica* group. Ashmead makes *A. cerana* Fabricius a distinct species, with *sinensis* Smith and *japonica* Radoszkowski as synonyms. The identity of *cerana* seems to be doubtful, and *sinensis* is not the same variety (in a restricted sense) as *japonica*. Smith records *A. nigrocincta* Smith also from Japan. I have a Chinese *nigrocincta* from Smith's collection, and can not agree with Buttel-Reepen's view that it is identical with *peroni* Latreille. True *peroni*, as described by Latreille, has the fulvous color confined to the first three abdominal segments, while *nigrocincta* has all the segments fulvous, with black borders.

APIS INDICA PERONI Latreille.

I refer here to a series of specimens from Pekin, China (M. L. Robb) and Foochow, China (J. P. Grant). The amount of fulvous on the abdomen varies, from that required by the original description (first two segments fulvous except broad hind margins, base of third fulvous) to the small amount at base described for the variety *picea* Buttel-Reepen. These are evidently only individual variations. The scutellum is usually dark, but sometimes dull yellow. There is also a worker *peroni* from Horisha, Formosa (T. Fukai).

APIS INDICA Fabricius.

Shanghai, China (E. Deschamps). A pallid form, with the scape red.

XYLOCOPA CIRCUMVOLANS Smith.

Japan; three females and one male. One female is from Tokyo. The male and two females were collected by Mitsukuri. One female labeled "Southern China" has the middle of the occiput with yellow hair, to that extent approaching *X. appendiculata* Smith, but otherwise it is like *circumvolans*. Pérez suggests that *appendiculata* and *circumvolans* are varieties of a single species.

XYLOCOPA LATIPES (Drury).

Buitenzorg, Java (D. G. Fairchild); Trong, Lower Siam (W. L. Abbott); Thagata, Tenasserim (Fea). In Bingham's description of the male (Fauna of British India) for tibiae read basitarsi.

XYLOCOPA LUNULATA MINENSIS Cockerell.

South China; one male.

XYLOCOPA CONFUSA Pérez.

Bg. Tambelan Island, China Sea (W. L. Abbott); Trong, Lower Siam (W. L. Abbott); Shanghai, China (E. Deschamps); Buitenzorg, Java (D. G. Fairchild).

XYLOCOPA SINENSIS Smith.

Four females from Foochow, China (H. R. Caldwell). This is the type-locality.

XYLOCOPA COLLARIS Lepeletier.

Khow Sai Dow Mountain, 1,000 feet, Lower Siam (W. L. Abbott); Trong, Lower Siam (W. L. Abbott).

XYLOCOPA NITIDIVENTRIS Smith.

Kukiar, eastern Turkestan, July 28, 1894 (W. L. Abbott).

XYLOCOPA COLLARIS NIGRESCENS Friese.

Like *X. collaris binghami* Cockerell, from the Khasia Hills, but distinguished as follows:

Female.—Abdomen distinctly greenish; light hair of front and sides of thorax bright fulvous, that on thorax in front more extensive and not distinctly defined posteriorly; sides of mesothorax and hind part of scutellum with short pale fulvous hair; wings, as in *binghami*, paler than in typical *collaris*.

Male.—Almost exactly like *binghami*, but a little larger (length about 21 mm.), and the fifth abdominal segment with a broad band of pale hair, which is separated from the pale-haired part of abdomen in front by a dark band (the first four segments being pale-haired).

Habitat.—Horisha, Formosa (T. Fukai).

This was described as new, but after the manuscript was sent in Friese published it as *X. sauteri*, var. *nigrescens*.

The following table separates the males of the *collaris* type:

First four abdominal segments pale-haired, and a broad pale band on fifth.	<i>nigrescens</i> .
First three segments pale-haired.....	<i>binghami</i> .
First two segments pale-haired.....	<i>collaris (dejeani)</i> .

SPHECODES JAPONICUS, new species.

Male.—Length 8 to 9 mm.; head and thorax black, very coarsely punctured, with dull white pubescence conspicuous on the face, prothorax (including tubercles), and pleura; mandibles dark; head transversely oval; face very broad, orbits strongly converging below; antennæ black, joints 2 and 3 mere rings, shorter together than fourth; joints 5 to 13 greatly swollen below, so that the flagellum is very strongly crenulated; mesothorax and scutellum with very large, irregular, partly confluent punctures; metathorax very coarsely sculptured all over with irregular ridges; posterior face of metathorax ill-defined

having a strong median sulcus; tegulae piceous at base, but the outer half pallid; wings hyaline basally, but the outer half of anterior and third of posterior suffused with dark fuscous; second *s. m.* narrow, receiving first *r. n.* at beginning of last third; third *s. m.* very large; legs black with pale hair, the knees and last joint of tarsi red; abdomen shining, sparsely punctured, constricted at base of second segment; first segment black except sides and broad apical margin, which are red; second and third segments entirely red, fourth and following segments black.

Habitat.—Japan; two males. The name adopted was given in manuscript by Ashmead, without description.

Type.—Cat. No. 13422, U.S.N.M.

Resembles the Indian *S. fumipennis* Smith in most respects, but the wings are more broadly pale at base, and the abdomen shows more black. *S. oriundus* Vachal, from Japan, differs by the proportions of the antennal joints and the lighter wings. There is much resemblance to the European *S. gibbus*. The antennae are quite of the *gibbus* type, but the fourth joint is considerably shorter.

SPHECODES MONTANUS Smith.

Bingham (Fauna of British India) states that the wings are hyaline, but I have examined Smith's type and find them pale fuscous.

OSMIA CHALYBEA Smith.

Edna, Texas, March 25, 1907 (F. C. Bishopp).

OSMIA LIGNARIA Say.

Dallas, Texas, March 7–17, at flowers of *Cercis canadensis* (Bishopp, Hood, and Cushman); Pittsburg, Texas, April 7 (F. C. Bishopp); Paris, Texas, March 3 and April 15 (A. A. Girault and C. T. Brues); Ardmore, Oklahoma, March 12, at flowers of peach (Bishopp); Mound, Louisiana, on turnip, March 7 (Bishopp).

OSMIA MITSUKURII, new species.

Female.—Length almost 12 mm.; head and thorax obscure greenish; abdomen black, with the hind margins of the segments rather broadly fulvous; ventral scopa orange, but seeming redder than it really is, owing to the orange pollen it carries; hair of head and thorax long but not dense, rather dull white more or less mixed with black, not at all ochreous or fulvous; face and vertex with much dark hair; lower part of cheeks with a large beard of white hair; dark hair of thorax above scanty; clypeus with a great triangular shining black excavation, strongly keeled down the middle, and bounded on each side by a large triangular projecting lamina; part of clypeus outside of the excavation green and punctured, the part just above the apex of excavation somewhat keeled; mandibles broad, tridentate, but the

middle tooth short, and the broad inner one rudimentary; malar space short but distinct; mesothorax and scutellum shining, well punctured, but not very densely; tegulæ dilute orange; wings hyaline stained with reddish-brown; legs black with red spurs; hair on middle basitarsus conspicuously red, on hind basitarsus dark fuscous; abdomen without hair-bands or spots, but with scanty long pale hair, and fuscous subapically on fourth and fifth segments; last dorsal segment with fine appressed hair. The flagellum is faintly reddish beneath.

Habitat.—Japan; No. 134, probably collected by Mitsukuri.

Type.—Cat. No. 13423, U.S.N.M.

Closely related to *O. taurus* Smith, from which it is known by the absence of fulvous pubescence on head and thorax, and to *O. excavata* Alfken, which is, however, only $8\frac{1}{2}$ mm. long. The area of the metathorax is dull and without evident sculpture, and the abdomen is rather long. As seen from above the general size and shape recalls *O. fulviventris* Latreille, but *fulviventris* has a larger head, a blue-black abdomen, and a brilliantly shining area of metathorax. *O. fulviventris* has an orange scopa, and the structure of its clypeus shows a certain approach to the condition in *O. mitsukurii*.

OSMIA MATSUMURÆ, new species.

Male.—Length about $8\frac{1}{2}$ mm.; head and thorax very dark bluish-green; abdomen dark olive green, the apical margins of the segments extremely narrowly, hardly noticeably, testaceous; antennæ long and slender, black, last joint normal; face with abundant long white hair, as also cheeks below; more or less pale hair on upper part of head, but sides of front, vertex, and upper parts of cheeks with a good deal of black hair; head and thorax quite closely punctured, scutellum less closely; area of metathorax dull, without evident sculpture, somewhat shining in certain lights; hair of thorax long, slightly yellowish, not mixed with black; tegulæ piceous, slightly rufous in middle; wings brownish-hyaline; recurrent nervures entering second submarginal cell at about the same distance from base and apex, whereas in *O. mitsukurii* the first recurrent enters about twice as far from the base as the second from the apex; legs black with pale hair; last two tarsal joints ferruginous; hind basitarsus simple with ferruginous hair on inner side; abdomen with scanty long hair like that of the thorax; sixth segment entire, quite simple, not reflexed; seventh entire, broadly truncate; ventral segments quite simple; stipites simple, with a mere obtuse median angulation; notch in sagittal plate a little longer than half breadth of plate.

Habitat.—Sapporo, Japan (Matsumura). Apparently close to *O. mitsukurii*, but owing to the quite different tegulæ and the venation can not be its male. It is structurally similar to the male of *O. taurus*, and among European species to *O. bicornis* Linnæus.

Type.—Cat. No. 13424, U.S.N.M.

CROCISA JAPONICA Friese.

One from Japan. *C. centrimacula* Pérez, also from Japan, and published in the same year (1905) is very closely allied, but apparently separable by the pattern of the first abdominal segment, the white (instead of blue) hair on hind basitarsi, and some other small details.

BOMBUS SAPPOROENSIS, new species.

Female.—Like the European *B. terrestris* Linnæus, but hair on last three abdominal segments pale reddish-fulvous; yellow bands on second abdominal segment and prothorax pale and dull, the thoracic one with black hairs intermixed; labrum with a transverse curved ridge, and below this much red hair; third antennal joint about as long as fifth, fourth a little shorter; malar space broader than long.

Habitat.—Japan; from M. Matsumura, Sapporo Agricultural College. This is a Japanese form of *terrestris*, regarded as a distinct species because the European *terrestris* seems to present no such color-variety. *B. terrestris japonicus* Friese, 1909, has the end of the abdomen black; it may perhaps be a variation of *sapporoensis*, but if so, the name *japonicus* is not available, having been earlier used by Dalla Torre. *B. harmandi* Pérez has the abdomen colored like that of *sapporoensis*, but it is a species with elongated head, allied to *B. hortorum*.

Type.—Cat. No. 13425, U.S.N.M.

BOMBUS SENILIS Smith.

One worker; Sapporo Agricultural College, Japan, December, 1896 (M. Matsumura). Smith described only the female. The worker looks exactly like *B. silvarum*, but the specimen before me has the light pubescence creamy-white, with a strong yellow tinge on the second abdominal segment.

BOMBUS DIVERSUS Smith, 1869.

Eleven from Japan; some collected by Mitsukuri. One is from Tokyo. These agree with a *diversus* from F. Smith's collection. Friese makes both *diversus* Smith and *japonicus* Dalla Torre (*terminalis* Smith, 1873) varieties of *B. hortorum*, subspecies *ussurensis* Rałoszkowski, 1877. If this is considered correct priority demands that *diversus* be used for the subspecies.

BOMBUS IGNITUS Smith.

Seven from Japan; some collected by Mitsukuri. Very like *B. lapidarius* Linnæus, but malar space shorter. Pérez considers that it is structurally nearer to *B. terrestris*. The pubescence of *ignitus* varies, the black becoming a dark chocolate brown, as is also seen in *B. hæmorrhoidalis*. This brown variation is especially marked in a female labeled "South China." This Chinese *ignitus* is readily known from *B. simillimus* Smith by the paler wings.

BOMBUS SPECIOSUS Smith.

Seven from Japan (Mitsukuri). This greatly resembles the Chinese *B. trifasciatus* Smith, but is clearly distinct.

BOMBUS BICOLORATUS Smith.

Horisha, Formosa (T. Fukai).

BOMBUS BIZONATUS Smith.

One female; Tagdumbash, Pamir, 13,000 feet, June 9, 1894 (W. L. Abbott). In Schmeideknecht's tables this runs nearest to *nivalis*, but is not of that group. It looks much like *braccatus* Friese, but differs in the antennæ, mandibles, etc. It is very close to *B. hortorum*, but distinct.

The following characters may be noted: Mandibles strongly notched near inner apical corner; third antennal joint about as long as 4+5; third *s. m.* much longer than in *hortorum*; apical segments of abdomen whitish-red, black abdominal band narrow, thoracic band much narrower than in *hortorum*.

CHELYNIA ELEGANS Cresson.

Two from Flagstaff, Arizona, at flowers of *Iris*, June 11, 1909 (F. C. Pratt).

HABROPODA PEKINENSIS, new species.

Male.—Closely related to *H. zonatula* Smith; on comparison with a *zonatula* from Smith's collection (Nicopolis, May, 1836) the following differences are found: A little less robust; abdomen narrower, less triangular, more as in *Anthophora*; pubescence paler, not so red; flagellum longer and more slender, fourth antennal joint much longer; first *r. n.* not quite reaching apex of second *s. m.*; black on clypeus reduced, the middle broadly yellow to top, the large black markings variable, but constricted in middle; pygidial plate much broader; anterior femora strongly keeled beneath at base; hind tarsi red. The anterior coxæ have the characteristic long backwardly-directed spines, and the hind basitarsi the great flattened lamina. The male is the type.

Female.—About 16 mm. long, with the same ochreous hair covering thorax, the same black abdomen with light hair-bands; face, mandibles, and antennæ entirely dark; fifth abdominal segment with the hair clear fox-red in middle, cream-colored at sides; scopa of hind legs light golden-ferruginous; eyes pale green, stained with red.

Habitat.—Pekin, China, 1901 (M. L. Robb). Four males; April 19 (2), April 20, April 21. Twenty-three females; April 19 (12), April 20 (5), April 21 (5), April 22 (1).

Type.—Cat. No. 13426, U.S.N.M.

Known from *H. krishna* Bingham by the deep yellow face markings of male (face marks white in *krishna*); from *H. fulvipes* Cameron by the absence of light face marks in the female, and the dark legs (legs are fulvous in female *fulvipes*); from *H. montana* Radoszkowski by the dark, pale-banded abdomen (abdomen densely covered with hair in *montana*); from *H. magretti* Bingham by the black flagellum of the male and the darker legs; from *H. mælleri* Bingham by the dark abdomen (abdomen and legs honey-yellow in *mælleri*); from *H. balassogloi* Radoszkowski by the black flagellum of the male, etc.; from *H. turneri* Cockerell by the unicolorous hair of thorax, etc.

ANTHOPHORA ZONATA (Linnæus).

Four from Foochow, China (H. R. Caldwell).

ANTHOPHORA FIMBRIATA Smith.

Khow Sai Dow Mountain, 1,000 feet, Lower Siam (W. L. Abbott); Trong, Lower Siam (W. L. Abbott). These females differ from the type as described by Bingham and Smith by having the metathorax black-haired. The hair of the thorax above is not "grey," as Bingham states, or "bluish-white, tipped with black," as Smith has it, but is very pale blue mixed with black. This species strongly imitates *Mesotrichia abbotti* Cockerell, which lives in the same region.

MEGACHILE XYLOCOPOIDES Smith.

Five females, Mansfield, Louisiana, at flowers of *Helenium tenuifolium*, July 4 and August 22 (F. C. Bishopp).

MEGACHILE VELUTINA Smith.

One female, Khow Sai Dow Mountain, 1,000 feet, Lower Siam, February, 1899 (W. L. Abbott); five females, Trong, Lower Siam, January, February, 1899 (W. L. Abbott). Only one (Trong) has the first two abdominal segments with red hair; the others have the first and basal part of second with red hair. The allied *M. dimidiata* varies in the same manner, according to Bingham. The one from the mountain is smaller than the others.

HETERANTHIDIUM CHIPPEWAENSE (Graenicher).

I am indebted to Doctor Graenicher for a cotype of his *Anthidium chippewaense*; it proves to belong to *Heteranthidium*.

DIANTHIDIUM ILLUSTRE (Cresson).

At Flagstaff, Arizona, at flowers of *Iris*, June 11, 1909, Mr. F. C. Pratt took a large variety of the female of this species, about 17 mm. long, the width of the abdomen fully 6 mm. The wings are very dark; the first *r. n.* joins the second *s. m.* a short distance from base (as in

A. conspicuum), and the second goes a like distance beyond apex. There is a small pulvillus, present also in typical *illustre*. I think there is no doubt that *Anthidium illustre* must be referred to *Dianthidium*. The Flagstaff specimen also has these characters: First two abdominal bands notched behind laterally; black on inner side of hind femora not notched; other colors, of head, legs, etc., normal; hair of face, and head and thorax above strongly reddish; yellow occipital band not interrupted. This female takes on some of the color characters normal for the male. It is possible that a distinct subspecific form of *D. illustre* exists in the region about Flagstaff, but more material is needed to decide this.

NOMADA BELFRAGEI, var. XANTHOGASTER, new variety.

Female.—Agrees with Cresson's description of *N. befragei*, except as follows: Only a slight blackish suffusion about ocelli; thoracic markings clear lemon yellow; abdominal segments 1 to 5 each with a very broad lemon yellow band, but those on first and second narrowly interrupted in middle, and that on first including a small red spot on each side posteriorly; venter with yellow spots down the middle, those on segments 3 and 4 large and conspicuous. As in true *befragei* (concerning which I have notes from Mr. Viereck, based on Cresson's type), the third antennal joint is conspicuously larger than the fourth, and the basal nervure meets the transversomedial. The second *s. m.* is considerably narrowed above, and receives the first *r. n.* a little beyond the middle. The anterior coxal spines are present, but very short. From the related *N. wheeleri* Cockerell this is easily known by the entirely terra-cotta red mesothorax and metathorax. Superficially, it looks exactly like *N. lamarensis* Cockerell, but is easily separated by the very large, strongly punctured tegulæ; the much lighter wings; and the hair at apex of abdomen all pale (much black in *lamarensis*). The coarsely punctured abdomen separates it at once from the similar species of *Xanthidium*.

Habitat.—Texas (Belfrage).

Type.—Cat. No. 13427, U.S.N.M.

NOMADA MACULIFRONS, var. COMPARATA, new variety (? new species).

Female.—Length about 10 mm.; differs from Smith's description of *maculifrons* as follows: Lateral black bands of mesothorax much enlarged, so that it is better described as black marked with red; antennæ clear ferruginous, not at all fuscous above; vertex and front except sides (which are red) black, the black extending down to sides of clypeus, but inclosing a large red supraclypeal mark; metathorax black, with two obscure small red spots on each side; scutellum black, strongly bigibbous, the gibbosities yellow with a red margin;

postscutellum with a short yellow band; band on fourth abdominal segment notched but not interrupted; that on fifth divided into two large spots; third ventral segment with two large yellow marks, fourth with one. Especially characteristic of the species is the large, smooth and shining yellow mark on each side of face. Structural characters, not mentioned by Smith, are as follows: Mandibles simple; third antennal joint shorter than fourth, though both are quite long; tegulæ rather large, well punctured; area of metathorax rugose basally; wings long; *b. n.* going far basad of *t. m.*; second *s. m.* receiving first *r. n.* before middle; abdomen very finely punctured; crescentic apical patch rather large. The femora, tibiæ, and tarsi are entirely red, except that the hind femora have a blackish streak behind. The tubercles are prominent, yellow margined with red, and the upper border of the prothorax is yellow, red at each side. There is a very large red patch on the pleura. This is perhaps a distinct species, but as it is evidently close to *N. maculifrons*, and I have not been able to compare specimens; I leave it for the present as a variety. The abdomen, in its color and pattern, shows a strong superficial resemblance to that of *N. ruficornis* Linnæus, variety, from Jena; but in the *ruficornis* the yellow spot on the third segment is sublateral instead of lateral, and there is no yellow spot laterad of the band on the fourth. In Schmiedeknecht's table of European species it runs to 52, and runs out because the yellow spots on scutellum are separated, and the hind tibial apical spinules are red. It runs nearest to *N. lineola* Panzer, which it really does resemble to a considerable extent.

Habitat.—Japan.

Type.—Cat. No. 13428, U.S.N.M.

NOMADA RUFICORNIS KOEBELEI, new subspecies.

Female.—Length about 9 mm., not especially robust, ferruginous, marked with black and yellow, the yellow confined to the abdomen. Head broad, ferruginous, including labrum and the simple mandibles; a black band extends from each side of clypeus to middle of front, which is broadly black; ocelli on a black patch, but a transverse red band in front of them; eyes light red; antennæ long, rather thick, entirely ferruginous; third joint long, but shorter than the very long fourth; fifth about as long as third; mesothorax and scutellum little hairy, very densely punctured; mesothorax with three black bands, the lateral ones partly evanescent; scutellum moderately elevated, entirely red; area of metathorax large, triangular, plicate at base; metathorax with a broad median black band, becoming greatly enlarged below the area; mesopleura red; tegulæ red, well punctured; wings with a broad dark apical margin; *b. n.* meeting *t. m.*; second

s. m. not nearly so broad as third, receiving first *r. n.* beyond the middle; legs red, the femora wholly without black; abdomen bright ferruginous, nearly the basal half of first segment black, the margin of the black straight; first segment wholly without yellow; second with a very large triangular lemon-yellow mark on each side, the distance between the yellow patches less than the length of one; third segment without yellow; fourth with an interrupted yellow band; fifth with a very large quadrate yellow patch, about twice as broad as long; apical pubescent lunule narrow (anteroposteriorly); pygidial plate broad; apical hair pale brown; third and fourth ventral segments each with a broad yellow band. Japan (Kœbele); =type.

Female (var. *a.*).—Third antennæ joint shorter; middle of face black, with a red supraclypeal spot; metathorax with more black; *b. n.* going some distance basad of *t. m.*; second *s. m.* broader, receiving first *r. n.* at middle; femora with a little black at extreme base; band on fourth abdominal segment entire; no yellow on underside of abdomen. Japan. "23.4" on the label may mean that it was taken on April 23. This is very possibly a distinct species.

Male.—Agrees in venation with the type female. Head and thorax black; broad lower margin of clypeus, mandibles except tips, labrum, and very narrow lateral face-marks ending in a point about level of antennæ, all yellow; scape stout, black behind, red in front, with a yellow patch on inner (mesad) side; flagellum black above, ferruginous beneath; third antennal joint much shorter than fourth; posterior half of tubercles, and two small spots on scutellum, red; middle femora with a black band behind, hind femora largely black; black of first abdominal segment broadly lobed in middle, and a small black spot on each side; second segment with a broad black basal triangle, projecting between the yellow marks; third and fourth with about the basal half black; third with a yellow band below the black on each side; fourth with a narrow interrupted yellow band; fifth with a patch; apical plate truncate, not notched; venter with large yellow markings. Japan, No. 163.

Type.—Cat. No. 13429, U.S.N.M.

I first compared this insect with the Old World *Nomadæ* in my collection, and concluded that it was very close to *N. ruficornis* (Linnæus). I then ran it in Schmiedeknecht's tables of European *Nomada*, and found that the male ran directly to *ruficornis*; the female less certainly, but still better there than anywhere else. It is well known that *N. ruficornis* is exceedingly polymorphic, and while the Japanese insect may be specifically distinct, and perhaps the var. *a* is another species, it seems best to treat the scanty material at present available as a subspecies only. On the whole, it evidently comes nearest to the northern variety *glabella* Thomson. The male is very like the American *N. illinoensis* Robertson.

NOMADA FRIESIANA Cockerell.

This has been known only by the unique type. The U. S. National Museum contains 2 females collected at Denver, Colorado, May 23, 1898. The name of the collector does not appear on the labels. The insect has a curious superficial resemblance to the European *Pasites maculatus*.

NOMADA HAKONENSIS, new species.

Male.—Length slightly over $6\frac{1}{2}$ mm.; head and thorax black, densely punctured, with the usual amount of hair, which is pale ochreous above and white beneath; head broader than long; lower margin of clypeus, narrowly in middle, broadly at sides, lower corners of face, ending in a fine point above which hardly reaches level of antennæ, labrum, and mandibles except their ferruginous apices, all yellow; mandibles simple; labrum densely covered with light hair; eyes pale greenish; antennæ long, black above, ferruginous beneath, the red on the rather stout scape reduced to a streak; third antennal joint hardly half length of fourth; fourth long; fifth longer than third; tubercles and a little of upper margin of prothorax red, but scutellum, etc., wholly black; area of metathorax shining and strongly plicate basally; femora with much black; tibiæ and tarsi red, the tibiæ with a weak black stripe; hind basitarsi, dark above; tegulæ ferruginous; wings strongly dusky on apical margin; stigma and nervures dark ferruginous; *b. n.* going far basad of *t. m.*; second *s. m.* about as broad above as below, receiving first *r. n.* before the middle; abdomen shining, without distinct punctures, dull ferruginous marked with black, the markings suffused, the general effect being very dark red; first segment with the basal half black, the black broadly lobed in middle, and having a dark spot on each side; the other segments obscurely blackish at base; hind margins of segments, especially the posterior ones, more or less pale golden; apical plate deeply notched; venter dark ferruginous.

Habitat.—Hakone, Japan (Kœbele).

Type.—Cat. No. 13430, U.S.N.M.

A small species of *Nomada s. str.*, quite different from all those reported from Japan, but superficially like the European *N. flavoguttata*. In Schmiedeknecht's table it runs near to *N. fabriciana* (Linnæus), but it is by no means identical.

NOMADA XANTHIDICA Cockerell.

A slight variety of the female having the metathorax wholly black. Two from Peking, China (M. L. Robb). One is dated May 7, 1901.

NOMADA ZEBRATA Cresson.

Male.—At flowers of *Helianthus pumilus*, Boulder, Colorado, July 21, 1908 (S. A. Rohwer); female, Fort Collins, Colorado, 1899 (No. 26).

NOMADA LIBATA Cresson.

Female.—Custer County, Colorado (Cockerell). This fine species looks exactly like *N. vallesina* Cockerell, except that it is larger and more robust. The following differences appear on minute comparison:

Inner orbits almost parallel; third antennal joint longer; anterior coxæ with a rudimentary spine; scutellum slightly bigibbous; apical part of flagellum darkened; cheeks entirely red; tegulæ large.....*N. libata*.
 Inner orbits diverging above; third antennal joint shorter; scutellum strongly bigibbous; apical part of flagellum red like the rest; posterior part of cheeks black; tegulæ ordinary.....*N. vallesina*.

NOMADA SEMISCITA Cockerell.

A male from Denver, May 26, 1898, has a short broad supra-clypeal mark in the manner of *N. martinella* and *scita*. The species differs from these by the comparatively short and thick fourth antennal joint (in *martinella* this joint is quite long and excavated on the outer side), the fifth joint with a prominent thorn-like spine, the second *s. m.* receiving the first *r. n.* at the middle (beyond in *martinella*), the postscutellum entirely black, the two light marks on the first abdominal segment each inclosing a ferruginous spot. In the new specimen the apical plate of the abdomen is strongly notched. This is perhaps the male of *N. frieseana*.

NOMADA SCITA Cresson.

Males are from Denver, Colorado, May 26, 1898; Colorado, 2076 (Baker collection), and Los Pinos, Colorado, at *Erigeron* May 22, 1899. This is smaller than male *N. martinella*, but on comparing a series the supposed differential characters seem evanescent and I am not altogether satisfied that the two species are distinct. The female of *N. scita* has not been described, but one was taken by Baker at Los Pinos, Colorado, on *Erigeron*, May 22, 1899. It is smaller and darker than *N. martinella*, but otherwise similar. Comparison was made with the usual Colorado *martinella*; but the true type of that species from New Mexico was small, though clear bright red.

NOMADA MARTINELLA Cockerell.

The U. S. National Museum contains 7 females from Colorado (Baker 2076 and 1332). In my original description ^a for Sioux City read Sioux County.

NOMADA (MELANOMADA) HELENIELLA, new species.

Female.—Length 5–5½ mm.; head and thorax black, abdomen clear red; mandibles rather dark red; face broad, covered with appressed pale hair; antennæ dark, third joint reddish, shorter than fourth on

^a Proc. Acad. Nat. Sci. Phila., 1903, p. 590.

under side; tegulae shining dusky red; wings dusky at apex; *b. n.* meeting *t. m.*; legs dark reddish-brown, with white hair; sides and apex of abdomen with white hair. Closely resembles *N. grindeliae* differing by the smaller size and slightly in coloration. The abdomen may have a slight dusky suffusion. In both species there is a semi-circular finely white-tomentose area at the end of the abdomen.

Male.—Length about 4½ mm.; resembling *N. grindeliae*, but much smaller, with the abdomen variably suffused with reddish at the apices of the first two segments.

Habitat.—Victoria, Texas, at flowers of *Helenium tenuifolium* Nuttall, September 26, 1904 (J. C. Crawford). Four males and three females are before me, and as the small size is uniform, I think the species must be considered distinct. Mr. S. A. Rohwer had already recognized it as new. There is some question whether *Melanomada* should not stand as a distinct genus. Mr. J. C. Crawford examined the mouth-parts of *N. grindeliae*, and found that the maxillary palpi had joints 3 to 5 subequal, 6 longer; joint 2 about equal to 3 + 4; joint 1 shortest. He pointed out that the development of joint 2 was characteristic.

Type.—Cat. No. 13431, U.S.N.M.

There is a rather close resemblance between *Melanomada* and *Viereckella*. Doctor Graenicher has sent me both sexes of *Viereckella pilosula* (*Nomada pilosula* Cresson) from Milwaukee, Wisconsin, where it flies in July and August. Both sexes have the abdomen black, resembling the male of *Melanomada*. The males are separable by several good characters, as follows:

Face broad, inner orbits parallel; venation ordinary for *Nomada*, second *s. m.* receiving first *r. n.* well before end, third *s. m.* narrow above; legs ordinary; apical plate of abdomen broad, rounded, broadest at base..... *Melanomada*.
Inner orbits strongly converging above, so that the lateral ocelli are distant from eyes less than their own diameter; second *s. m.* receiving first *r. n.* very near end, third *s. m.* very broad above; middle and hind femora incrassate; apical plate of abdomen spoon-like, narrower toward base..... *Viereckella*.

The type of *N. heleniella* is a female.

NOMADA WHEELERI ENGELMANNIÆ, new subspecies.

Female.—Length 7½ to 9 mm., agreeing with the description of *N. wheeleri* except as follows: Light markings cream-color; red line along anterior orbits interrupted in frontal region; mesothorax with a broad black band, and the red in front deeply emarginate on each side; light color of scutellum narrowed but not divided in middle; pleura red, broadly margined, except below, with black, and with no yellow spot; wings more dusky, the broad apical margin dark; first abdominal segment with the basal half black; second and third segments with much black at base, band on second narrowly or broadly interrupted, but always extremely broad laterally.

Habitat.—Dallas, Texas, May 22, 1906, at flowers of *Engelmannia pinnatifida* Torrey and Gray (W. S. Pierce); also one from Dallas, May 17, 1908 (F. C. Bishopp). Perhaps a distinct species, but certainly very close to *N. wheeleri*, which is known from a single specimen. These species fall in a little group, in which the coxal spines are not distinctly developed, and yet the insects accord in general with the subgenus *Micronomada*.

Type.—Cat. No. 13432, U.S.N.M.

The following key contrasts the members of this group:

- | | |
|---|-------------------------------|
| Mesothorax at least largely red (Texas)..... | 1. |
| Mesothorax black without red..... | 2. |
| 1. Markings yellow; pleura with a yellow spot..... | <i>wheeleri</i> Cockerell. |
| Markings cream-color; pleura without a yellow spot..... | <i>engelmanniæ</i> Cockerell. |
| 2. Markings yellow (Virginia)..... | <i>mimula</i> Cockerell. |
| Markings creamy-white (Washington State)..... | <i>jennei</i> Cockerell. |

Since the above was written I have examined two males of *N. wheeleri engelmanniæ* collected by Mr. C. L. Marlatt in Riley County, Kansas, September. They have the following distinctive characters:

Length about 9½ mm.; coxal spines absent; face light lemon yellow up to level of antennæ, the lateral face marks extending obliquely upward laterally, ending in a sharp point on orbital margin near level of middle of scape; supraclypeal mark square; labrum, and base of mandibles broadly, pale yellow; posterior orbital margin narrowly pale yellow; *scape greatly swollen, entirely bright ferruginous red*; flagellum darker red; third antennal joint much longer than fourth; mesothorax very densely punctured, entirely black; metathorax black, with a small red spot on each side; upper border of prothorax, tubercles, tegulæ, scutellum, and postscutellum cream-color; pleura with a very large red patch, inclosing a variable yellow one; legs red, hind coxæ with a large whitish spot; abdomen like that of female; apical plate broad and rounded, with a feebly indicated notch. Some one had labeled this "*heiligbrodtii* Cresson?". It is entirely different from the described male of *heiligbrodtii*, which (according to Viereck, who examined the type for me) has a slender scape. I have long thought that the described male of *heiligbrodtii* did not truly belong with the female, but the female of the present insect is known, and is quite distinct from *heiligbrodtii*.

NOMADA RUBICUNDA Olivier.

Liberty, Texas, 2 females, March 18, 1908 (E. S. Tucker).

NOMADA ARTICULATA Smith.

Mound, Louisiana, April 2 (F. C. Bishopp) and May 12 (C. R. Jones). Boulder, Colorado, nesting in my garden, June (Cockerell). I examined the spine on the anterior coxa of a Louisiana male, and found it about 150 μ long, very broad at base, hidden among plumose hairs twice its length, which carry pollen.

NOMADA LIMATA Cresson.

Brownsville, Texas, November 24, 1909 (F. C. Pratt). A species heretofore known from tropical Mexico only. *N. pampicola* Holmberg, which I have from Paraguay (Schrottky), is closely allied.

NOMADA VIERECKI Cockerell.

Ladonia, Texas, May 25, 1904, at flowers of *Rudbeckia* (Bishopp). Previously known only from New Mexico and the State of Chihuahua, Mexico.

NOMADA GARCIANA Cockerell.

This species was described from a specimen taken in the Mesilla Valley, New Mexico. The specimens from Texas have a slightly different aspect, but after careful comparison I can not find any characters on which to separate another species. The insect looks like a small *N. texana*, but the mesothorax is shining, with well separated punctures. The Texan variety may be distinguished by the yellow markings of the head and thorax (varying in depth of color), those of the New Mexico type being ivory color.

Falfurrias, Texas, at flowers of *Helianthus*, May 18, 1907 (A. C. Morgan); Runge, Texas, September 20, 1906, both sexes (J. C. Crawford); Calvert, Texas, April 5 and 10 (C. R. Jones); Eagle Pass, Texas, March 30, 1908 (Jones and Pratt).

NOMADA PUTNAMI Cresson.

Like a large *N. garciana*, the punctures on mesothorax well separated; the markings of head and thorax yellower. Laredo, Texas, at flowers of *Prosopis glandulosa*, June 5, 1907 (R. A. Cushman); Ladonia, Texas, at *Rudbeckia*, species, May 25, 1904 (Bishopp). *N. putnami* was described from Utah; the insect from Texas may prove to be distinct, but as it agrees with Cresson's description I can only refer it to his species.

NOMADA RIVALIS Cresson.

California, one male (Morrison). This species is very close to the Rocky Mountain *N. ornithica* Cockerell; they may be separated as follows:

Larger; *b. n.* going a considerable distance basad of *t. m.*; second *r. n.* received about middle of third *s. m.*; black bands from antennæ half way down sides of clypeus; scutellum with two yellow spots; postscutellum black; hind femora ordinary. . . *rivalis*.
Smaller, but variable in size; *b. n.* meeting *t. m.*, sometimes a little on the basad side; second *r. n.* received much beyond middle of third *s. m.*; no black bands extending down from antennæ; yellow of scutellum not divided into spots; postscutellum with a yellow band; hind femora stout. *ornithica*.

NOMADA CROTCHII Cresson.

Two females, Los Angeles County, California, April (Coquillett).

NOMADA PASCOENSIS Cockerell.

One male, Los Angeles County, California (Coquillett 482).

NOMADA MARGINELLA Cockerell.

A slight variety, with the *b. n.* going some distance basad of *t. m.*, but all other characters normal. One female, Los Angeles County, California (Coquillett).

NOMADA VINCTA Say.

Females, Riley County, Kansas, August and September (Marlatt).

NOMADA LAMARENSIS Cockerell.

This was described from a single male taken at Lamar, Colorado. Mr. W. M. Mann sends me one of each sex from Canadian, Texas, July 27 and 29, 1905. The male is larger than the original type (fully 11 mm. long), and the black is much reduced, on the head to the ocellar area, on the thorax to a slight stain along the anterior edge of the mesothorax. All the tibiae are marked with yellow. These differences are apparently not racial. The female looks like the male, but the face is all red, with a slight yellowish suffusion on each side. The legs show less yellow.

NOMADA TEXANA Cresson.

According to the material before me, this is by far the most abundant *Nomada* in Texas. The localities represented are:

(1) Dallas, May 22, at *Engelmannia pinnatifida* flowers (W. D. Pierce); May 19, at *Gaillardia pulchella* flowers (Bishopp); September 13 (Bishopp). A large (about 10½ mm. long) male was taken at *Monarda citriodora*, July 3 (Crawford).

(2) Plano, about 17 miles north of Dallas, July (Tucker).

(3) Falfurrias, at *Helianthus*, May 18 (A. C. Morgan).

(4) Wolfe City, at turnip, May 20 (Bishopp).

(5) Mathis, May (A. W. Morrill).

(6) Paris, on cotton (C. R. Jones). Others taken at Paris by Bishopp have the tegulae more or less orange, perhaps the effect of cyanide.

(7) Ladonia, at *Rudbeckia*, May 25 (Bishopp); September 29, on cotton (Bishopp).

(8) Mineola, at *Heterotheca subaxillaris*, October 2 (Bishopp).

(9) Waco, at *Vernonia baldwinii*, July 25 (Bishopp).

(10) Riverside, August 22 (W. W. Yothers).

(11) Wichita Falls, at *Monarda*, April 11 (C. R. Jones).

(12) Cotulla, at *Verbesina encelioides*, April 17 (F. C. Pratt); at *Pithecolobium*, April 18 (F. C. Pratt).

(13) Beeville, June 5, in cotton fields (C. R. Jones).

Also East Point, Louisiana, September 5 (Bishopp).

The following localities produced a rather small variety, intermediate between *texana* and *crucis*:

(14) Kerrville, over 50, only one being a male. Collected in April, many at *Marrubium vulgare* flowers (Pratt and Dunham).

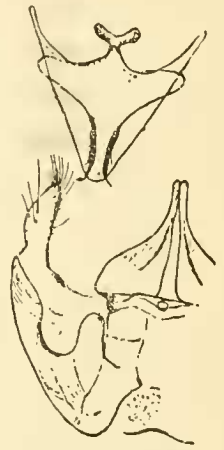
(15) Devils River, at *Monarda citriodora*, May 6 (Bishopp); at *Gaillardia pulchella*, May 2 and 6 (Bishopp); at Sumach, May 3 (Bishopp); at *Marilaunidium organifolium*, May 3 and 4 (Bishopp and Pratt).

(16) Del Rio, at *Ratibida columnaris* and *Pyrrhopappus carolinianus*, May 1 (Bishopp).

(17) Brewster County, Rio Grande, June 13-17 (Mitchell and Cushman).

NOMADA TEXANA CRUCIS (Cockerell).

Nomada crucis was described in 1903 as a doubtful subspecies of *N. texana*, based on the smaller size and coarser sculpture of the metathorax. As it occurs in southern New Mexico it appears sufficiently distinct from typical *N. texana* of east-central Texas, but the abundant material now before me clearly shows intergradation in south-central Texas, north of the Rio Grande. I give a figure of the genitalia of *N. crucis* from Devils River. I also prepared a slide of the genitalia of quite typical *texana* from Plano, and so far as I can see there is no essential difference. As we go down the valley of the Rio Grande, practically normal *N. crucis* is found to be mixed with larger individuals, which can be regarded as rather small *texana*. The females lead in this increase of size, but in humid Texas both sexes are of full *texana* size, and even at Cotulla (10 males 6 females examined) this is the case, with rare exceptions. It is not unlikely that *crucis* is largely or even wholly an environmental product, not gametically different from true *texana*.



GENITALIA OF MALE
NOMADA TEXANA
CRUCIS.

A single male *crucis* (here a mutant or dwarf of *texana*?) comes from Ardmore, Indian Territory, August 18 (Bishopp). The Texan material is as follows:

(1) Eagle Pass, March 30; male with third antennal joint shorter than usual (Jones and Pratt).

(2) Del Rio, both sexes, May 1 (Bishopp). Some are from flowers of *Pyrrhopappus carolinianus*.

(3) Cotulla, a single male from *Verbesina encelioides*, May 11 (J. C. Crawford).

(4) Devils River, 28 males, 1 female. Collected from *Marilaunidium organifolium*, May 3 (Pratt); *Sphæralcea angustifolia*, May 3 (Bishopp); *Aster* sp., May 1 (Bishopp); Sumach, May 6 (Bishopp); *Monarda citriodora*, May 4 (Pratt); *Gaillardia pulchella*, one specimen (Bishopp).

NOMADA (MICRONOMADA) MITCHELLI, new species.

Female.—Length 6 to 7 mm.; black, red, and yellow; head short and broad, face shining; clypeus, labrum, mandibles except tips, and whole of sides of face rather light ferruginous; supraclypeal area suffusedly reddish, front and vertex black; the red continues broadly upward some distance above antennæ, and then stops abruptly, except for a narrow line (sometimes absent) along the orbital margin, uniting with the narrow post orbital ferruginous stripes; vertex shining, not closely punctured; antennæ entirely ferruginous, the flagellum a little dusky above; third joint conspicuously longer than fourth; second joint of labial palpi much less than half length of first; thorax black, pleura with a large but variable red patch, and inclined to be suffused with reddish above; upper border of prothorax, tubercles, tegulæ, the rather strongly bilobed scutellum (except the posterior middle) and the postscutellum chrome yellow; the metathorax without light marks; pleura strongly and quite densely punctured; mesothorax shining, with well-separated punctures; wings dark, strongly reddish; stigma ferruginous; *b. n.* meeting *t. m.*; second *s. m.* broad, receiving first *r. n.* about middle (one specimen has only two submarginals on both sides, the second *t. c.* being wholly obliterated); legs entirely clear ferruginous, anterior coxæ with long spines; abdomen shining, but well punctured, black inclining to reddish, especially on the hind margins of the segments, with bright yellow bands, that on first segment narrow and interrupted, with a notch on each side in front, or reduced to two little crescents, or wholly absent; that on second extremely broad, but greatly narrowed in the middle; fifth with most of the surface yellow; venter wholly black.

Type.—Cat. No. 13433, U.S.N.M.

Male.—About 6½ mm. long; clypeus and broad lateral marks bright yellow, the latter receding from orbits above. This male is very close to *N. tiftonensis*, but the hind femors are merely dusky behind; the supraclypeal mark is reduced to an obscure dot; and the mesothorax is shining, the punctures distinctly separated. It is known from *N. garciana* by its very dark wings, very bright yellow face marks, and form of lateral marks.

Habitat.—Type (female) from Victoria, Texas, May 25, 1907 (J. D. Mitchell); also two others from the same place, May 3 and 25, 1907 (J. D. Mitchell). Male from Del Rio, Texas, May 8, 1907 (F. C. Bishopp). Nearest to *N. tiftonensis* Cockerell, from Georgia.

NOMADA (HOLONOMADA) AFFABILIS DALLASENSIS, new subspecies.

Female.—Looking exactly like *N. zebrata* Cresson, but with the mesothorax much more coarsely sculptured, and the *b. n.* going for basad of the *t. m.* The flagellum is entirely clear ferruginous, in the manner of *N. morrisoni* Cresson, not dark above as in *affabilis* Cresson. The

third antennal joint is always distinctly longer than the fourth, not about equal as in *morrisoni*. Superficially, the insect is like *N. lama-rensis*, but it is a *Holonomada*, and the metathorax, except the black (or black and red) basal area, is nearly all yellow. The basal area is considerably smaller than in *N. zebrata*. The pleura has a variable amount of yellow, and the mesothorax is always red with a single black band. The face is red, variably suffused with yellow.

Male.—Length 11 or 12 mm.; similar to *N. affabilis*, but obscure mark at top of eyes red; flagellum red, with its first six joints black above, the sides of the black sharply defined; wings yellowish; last abdominal segment (like the others) with a yellow band, the abdominal bands not narrowed in middle, except the first two slightly. The scape is thick, entirely yellow beneath. The yellow on the pleura is broadly margined with ferruginous. In my table ^a this runs to *affabilis*, except that the legs must be described as red, with yellow and black markings. The second *s. m.* is very large, and receives the first *r. n.* beyond the middle.

Habitat.—Dallas, Texas. Eight females (the type is a female), six from dewberry flowers, April 9, 1906 (Crawford and Pratt); one from blackberry, March 21, 1907 (Bishopp). One male at *Cercis canadensis*, March 22, 1909 (Bishopp).

Type.—Cat. No. 13434, U.S.N.M.

NOMADA (XANTHIDIUM) LUTEOLA BISHOPPI, new subspecies.

Female.—Third antennal joint almost or quite as long as fourth; flagellum clear red, dusky at the sutures above; mesothorax red banded with yellow, varying to reddish-black, with the median bands abbreviated; yellow of metathorax covering sides of basal area; pleura with a large yellow patch. This looks much like *N. affabilis dallasensis*, but is smaller, with the third antennal joint evidently shorter, and the mesothorax with yellow stripes.

Habitat.—Dallas, Texas, type at flowers of wild plum, March 16, 1907 (Bishopp); also one at flowers of dewberry, April 9, 1906 (J. C. Crawford). Dark variety, Monroe, Louisiana, March 4, 1908, at *Cratægus* flowers (R. A. Cushman).

A male *N. luteoloides* Robertson was taken at Logansport, Louisiana, March 24 (E. S. Tucker). I will also take occasion to record *N. luteola* Olivier from Helena, Montana, August 6, 1909 (Mann).

Type.—Cat. No. 13435, U.S.N.M.

The only male *Xanthidium* from Texas before me was taken by F. C. Bishopp at Wolfe City, at flowers of plum, March 5, 1908. It is *N. luteoloides*, but the anterior tibiæ have a large black mark behind.

NOMADA COQUILLETII Cockerell.

A new locality is Troy, Idaho, May 7, 1909 (Mann).

^a Proc. Phila. Acad. Nat. Sci., 1903, p. 580.

NOMADA EXCELLENS Cockerell.

A female from Los Angeles County, California, collected in May by Coquillett, is about 13 mm. long, but apart from its unusually large size agrees well with this species.

NOMADA JAPONICA Smith.

Specimens from Japan in the U. S. National Museum agree with one from Hiogo, from the F. Smith collection.

NOMADA CAROLINÆ Cockerell.

Longview, Texas, four females, March 26, 1908 (E. S. Tucker). Previously known from North Carolina and Virginia (Falls Church, Banks). The Texan specimens have the mesothorax variable from distinctly banded to bandless, and the band on the metathorax absent, though the lower corner of the inclosure is black.

NOMADA LEPIDA Cresson.

Mound, Louisiana, "on turnip," one male, March 7, (Bishopp).

Females are from Dallas, Texas, March 17, at *Rubus* (Cushman); Dallas, April 9, on dewberry (Crawford); Beaumont, Texas, March 18 (Tucker); Wolfe City, Texas, on *Cratægus*, March 27 (Bishopp); Paris, Texas, April 10 and 11 (Bishopp).

From Ardmore, Oklahoma, come many specimens. The males (on wild plum, Mar. 31, Bishopp) are small, and the tegulæ are pale reddish or yellowish-red, tending toward *cuneata*. The females are light colored, as in *lepida* (*cuneata* must evidently stand as *N. lepida cuneata*). The Ardmore females were taken by Bishopp on wild plum, and by Bishopp and Jones on blackberry, in March and April. Two have yellow marks on the fifth abdominal segment; all have the mesothorax with a single dark band. Ardmore is only a short distance from the Texas line, and while classed in the humid austral, is very near the boundary between the humid and arid. Paris and Wolfe, Texas, are well in the humid division.

NOMADA PARVA Robertson.

Females from Ardmore, Oklahoma, April 11, at *Salix* (Bishopp) and Denton, Texas, April 26 (C. R. Jones). The basal nervure does not go so far basad of the *t. m.* as in *N. infantula*, but the two are separated with difficulty in the female, especially as in the Denton specimen there are only two spots on each side of the abdomen.

NOMADA SAYI Robertson.

Females from Paris, Texas, April 11 (Bishopp), and Mound, Louisiana, April 2 (Bishopp). In these the basal nervure goes less basad of the *t. m.* than in a male *sayi* received from Robertson. From Pittsburg, Texas, April 7 (Bishopp) comes a female with two yellow

spots on the fifth abdominal segment, and the pygidial plate broadly rounded, closely and very finely pubescent. This ought to be *N. illinoensis* Robertson, but the antennæ are practically as in *sayi*—certainly not shorter, and there is no yellow on the lower corners of the face. Probably the *sayi*—*illinoensis* group—includes one or two species which have not been separated, but more material is needed, especially males. For the present I call the Pittsburg insect *N. illinoensis*, var. *a*.

NOMADA ILLINOENSIS Robertson.

Two males, Ardmore, Oklahoma, at flowers of wild plum, March 12 (Bishopp) and April 10 (Jones).

NOMADA VICTRIX, new species.

Female.—Length $7\frac{1}{2}$ to 9 mm., expanse up to about 15 mm.; bright ferruginous red, the strongly and closely punctured mesothorax without any black band, the scutellum very flat, not bilobed, shining, with large sparse punctures. Head broad, inner orbits parallel; face strongly punctured, no yellow at lower corners; mandibles simple; no black on head except a little stain between the ocelli, and sometimes a little on the hindmost part of the cheeks; antennæ entirely ferruginous, third joint longer than fourth, fourth shorter than twelfth; thorax nearly without black, but a variable black stain in the middle of the metathorax; hair at sides of metathorax short and scanty; tegulæ bright ferruginous; wings reddish-dusky, *b. n.* meeting *t. m.*; only two submarginal cells, the second *t. c.* wholly absent in all three specimens; legs red, hind femora and tibiæ more or less stained with dusky behind; abdomen dullish, without distinct punctures, red, the hind margins of the segments blackish; second segment with two large pyriform or oblong yellow spots or patches; third and fourth with small lateral spots; fifth without spots, or with very faint indications of them; silvery apical lunule small and narrow (short); pygidial plate broadly rounded; venter red without spots.

Habitat.—Victoria, Texas, three females at flowers of *Aster* November 6, 1904 (A. J. Leister). By the low scutellum, this is related to *N. simplex* Robertson. The possession of only two submarginal cells would suggest relationship with *N. (Heminomada) obliterated* Cresson, but this is fallacious, since in *obliterated* it is the first *t. c.* that is absent. *Nomada (Nomadita) montana* Mocsary is a European species with only two submarginal cells.

Type.—Cat. No. 13436, U.S.N.M.

NOMADA (GNATHIAS) BELLA CALLURA, new subspecies.

Male.—Length about 10 mm.; lower half of clypeus and narrow lateral marks pale yellow, the clypeal yellow more or less tridentate above; third antennal joint shorter than fourth; scape rather stout, black on inner (mesad) side, broadly red on outer; flagellum stout,

red, with the first five joints black above, and the others with blackish stains; thorax black, coarsely punctured, with the upper border of prothorax more or less, the tubercles and the scutellum red; a small red mark on pleura anteriorly; femora, tibiæ, and tarsi clear red, the femora black at base beneath; tegulæ red, punctured; second *s. m.* very broad, not narrowed above, receiving first *r. n.* beyond middle; abdomen clear light ferruginous red, with the spots light lemon yellow; base of first segment black right across; yellow markings consisting of two small marks on first segment, a very broad band, rather broadly interrupted in middle, on second, a broad band, broadly interrupted in middle, on third, and two small transverse marks on fourth; yellow on venter confined to a large spot on apical segment; apical plate strongly notched.

Habitat.—West Cliff, Colorado (T. D. A. Cockerell). From Ashmead's collection. Some of the assigned characters are doubtless variable, but the light abdomen is likely to be distinctive. The first abdominal segment is very much broader than in *N. perplexans* Cockerell, which also differs in other ways.

Type.—Cat. No. 13437, U.S.N.M.

NOMADA FORMULA Viereck.

Los Angeles County, California (Coquillett), one male. The apical plate of the abdomen is deeply notched.

NOMADA SEMISUAVIS Cockerell.

California, with number 324, one male; Coronado, California, June 18, 1890 (Coquillett), one female. New to California, and the female is new. The female resembles the male, and is distinguished from *N. suavis* by the very densely punctured mesothorax. The legs are yellow and black, with only a little red, and the metathorax has two very large yellow patches. The anterior coxæ are strongly spined.